Math 212
Quiz 23

M 24 Oct 2016

Your name: _____

Exercise

(2 pt) This exercise reviews integration factors for triple integrals. For example, in rectangular coordinates (x, y, z), the differential dV writes as

$$dV = dx\, dy\, dz.$$

Recall that by Fubini's theorem, if the function being integrated is continuous (or "not too discontinuous"), then the order of dx, dy, dz does not matter.

(a) (1 pt) Write the differential dV in terms of cylindrical coordinates (r, θ, z).

Solution: In cylindrical coordinates,

$$dV = r\, dr\, d\theta\, dz.$$

(a) (1 pt) Write the differential dV in terms of spherical coordinates (ρ, θ, φ).

Solution: In spherical coordinates,

$$dV = \rho^2 \sin\varphi\, d\rho\, d\theta\, d\varphi.$$